New research highlights the climate benefits of reducing lost and unaccounted-for gas

Romany Webb April 7, 2015

The Obama Administration reaffirmed its commitment to the fight against climate change last week. In a plan submitted to the United Nations on Tuesday, the Administration pledged to reduce climate damaging greenhouse gas emissions by 26 to 28 percent below 2005 levels by 2025. Much of this reduction is expected to come from the power sector.

As previously reported, the U.S. Environmental Protection Agency (EPA) is currently finalizing its Clean Power Plan, aimed at reducing carbon dioxide emissions from existing fossil fuel power plants by 30 percent by 2030. Achieving this aim will require a fundamental shift in power generation, with less reliance on carbon-intensive coal-fired generating units and increased use of natural gas and renewable energy units.

Natural gas is often said to be a "clean fossil fuel" as its combustion produces between thirty and fifty percent less carbon dioxide than the combustion of oil and coal respectively. Unfortunately however, the natural gas industry is a major emitter of methane. The EPA estimates that the industry accounted for 25 percent of methane emissions in the U.S. in 2013, more than any other sector except agriculture. Methane is emitted at all stages of natural gas production, from extraction and processing to storage and transportation.

At the transportation stage, methane emissions generally result from intentional venting and accidental leakage of natural gas. The extent of leakage depends on the characteristics of the pipeline system, including the type of material used, as well as its age and condition. Leaks are most likely to occur from older pipelines made of cast iron and bare steel. Recent studies indicate that such pipelines can leak up to 18 times more than plastic pipes and 57 times more than protected steel pipes.

Unfortunately, leak-prone cast iron pipes are frequently used to distribute natural gas to end users. New research, published last Tuesday by Washington State University (WSU), estimates that the gas distribution system emits 393,000 to 854,000 metric tons of methane each year. While this is lower than previous estimates, it still represents a significant portion of overall greenhouse gas emissions. Indeed, because methane is 84 times more potent than carbon dioxide over the first 20 years after it is released, these yearly emissions have the same climate impact as 19 coal-fired power plants.

The WSU study indicates that the bulk of methane emissions from the distribution system originate from a small number of pipes which are especially leaky. Of the 230 underground pipeline leaks measured in the study, just 3 were found to account for 50 percent of total methane emissions. However, despite their size, these leaks are often left unrepaired for months or even years.

The Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) regulates pipeline leaks with a view to minimizing risks to public safety. To this end, PHMSA regulations require pipeline operators to ensure the prompt repair of leaks posing a hazard to persons or property. The regulations do not, however, require non-hazardous leaks to be repaired. Just five states – Florida, Kansas, Maine, Missouri, and Texas – have adopted their own safety regulations establishing timeframes for the repair of non-hazardous leaks. The rest allow such leaks to be left unrepaired indefinitely.

In deciding whether to classify leaks as hazardous, pipeline operators focus on their proximity to buildings, rather than their size. Consequently, leaks in isolated areas may be classified as non-hazardous, even if they emit substantial amounts of methane. As the authors of the WSU study observed, "[b]ecause leaks are classified on the basis of safety…and not magnitude, [hazardous] leaks are not necessarily larger than" non-hazardous leaks.

Unfortunately, pipeline operators currently have little incentive to repair these large leaks, as the cost of leaked gas can be passed through to ratepayers. In *West Ohio Gas Co v. Public Utilities Commission*, 249 U.S. 63 (1935), the U.S. Supreme Court held that pipeline rates must include an allowance for "gas lost as a result of leakage, condensation, expansion or contraction." Following this decision, all jurisdictions allow pipeline operators to recover the cost of so-called "lost and unaccounted-for gas" in rates.

Broadly, lost and unaccounted-for gas reflects the difference between gas flows into and out of the pipeline system. This difference will vary depending on system characteristics but, according to industry experts, should generally not exceed 3 percent of pipeline throughput. This target is not, however, always achieved. Data from the PHMSA indicates that, in 2013, gas losses exceeding 3 percent were reported by more than 300 pipeline operators. Of those, approximately one-quarter reported gas losses of 10 percent or more, with some operators reporting 30 to 50 percent loss. This is a waste of a valuable resource, as well as a threat to public safety and the environment.

Lost and unaccounted-for gas is typically attributed to system leaks and measurement errors. While some loss of gas through these and/or other causes is inevitable, pipeline operators should reduce losses wherever possible. Encouraging such action will require changes in the way pipeline operators recover the cost of lost and unaccounted-for gas.

The KBH Energy Center will soon publish a new report examining the cost recovery frameworks with respect to lost and unaccounted-for gas in each jurisdiction. Our report suggests changes to those frameworks designed to promote improved management of lost and unaccounted-for gas. We recommend that:

- all jurisdictions adopt a uniform definition and standard formula for calculating lost and unaccounted-for gas;
- the cost recovery framework in each jurisdiction incentivize reduction of lost and unaccounted-for gas by rewarding pipeline operators for any decline, and penalizing operators for any rise, therein;
- regulators carefully scrutinize pipeline operator's claimed gas losses and, for this purpose, require operators to measure the amount of gas lost through leaks and other causes; and
- cost recovery for lost and unaccounted-for gas be capped at a level that will encourage pipeline operators to reduce gas losses over time.

These reforms would create a powerful incentive for pipeline operators to improve system management to reduce gas losses. This would have important economic benefits, conserving a valuable resource and reducing costs to society. Moreover, it would also have benefits for the environment, avoiding damaging methane emissions. Hopefully policy makers will remember this as they look at options for mitigating climate change.

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